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Re-evaluation Note

REV2015-12

Special Review of Trifluralin: Proposed Decision for Consultation

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1.0 Introduction

Pursuant to subsection 17(2) of the *Pest Control Products Act*, the Pest Management Regulatory Agency (PMRA) has initiated a special review of pest control products containing trifluralin based on the decision taken by the European Commission (EC) in 2010 (European Commission, 2010a) to not include the active substance trifluralin in Annex I to Directive 91/414/EEC due to environmental concerns. The initiation of the special review for trifluralin was announced in December 2013 (Canada, 2013a).

As required by subsection 18(4) of the *Pest Control Products Act*, the PMRA has evaluated the aspects of concern related to the pest control products containing trifluralin that prompted the special review. The aspects of concern relevant to the environment were identified as:

- Potential for long range transport via air
- Potential risk to aquatic organisms, in particular the chronic risk to fish

2.0 Uses of Trifluralin in Canada

Trifluralin, a pre-emergent soil herbicide used to control annual grasses and broadleaved weeds, is currently registered in Canada for use on ornamentals, shelterbelts, terrestrial food/feed crops, oil seed and fibre production crops. Currently there are four technical grade active ingredients, one manufacturing concentrate, twelve commercial and one domestic-class products containing trifluralin registered in Canada (Appendix I).

The PMRA completed the re-evaluation of trifluralin in 2009 (Canada, 2008; Canada, 2009a). As a result of the re-evaluation, the PMRA determined that products containing trifluralin do not present unacceptable risks to human health and the environment when used according to the revised conditions of use (for example additional personal protective equipment for mixers/loaders/applicators, restricted re-entry interval for post-application workers, and buffer zones to protect the environment).

3.0 Aspects of the Pest Control Product that Prompted the Special Review

The concerns identified in the 2010 European Commission decision to prohibit all uses of trifluralin (European Commission, 2010a; European Commission, 2010b) were considered for this special review, and they were related to:

- Potential for long range transport via air
- Potential risk to aquatic organisms, in particular the chronic risk to fish.

4.0 PMRA Evaluation of the Aspects of the Pest Control Product that Prompted the Special Review

Following the initiation of the special review of trifluralin, the PMRA requested information from provinces and other relevant federal departments and agencies, in accordance with subsection 18(2) of the *Pest Control Products Act*. In response, water monitoring data for trifluralin were received.

In order to evaluate the aspects of concern for trifluralin, the PMRA has considered currently available relevant scientific information, which includes information considered for the re-evaluation of trifluralin (Canada 2008; Canada 2009a) and any relevant information obtained since then, such as information prepared by Canada for considerations for the review of trifluralin under the Long Range Transboundary Air Pollution and Persistent Organic Pollutants Protocol (LRTAP POPs Protocol) (Canada, 2009b; Canada, 2011), the information on Canadian incident reports, Canadian and the US surface water monitoring data, and Canadian air monitoring data from the Canadian Northern Contaminates Program (NCP) (Canada, 2013b).

4.1 Potential for long range transport via air

Trifluralin is considered volatile based on the vapour pressure of 6.1 mPa (25°C) and is expected to rapidly volatilize from moist soil and water surfaces based on the Henry's Law constant of $15 \text{ Pa} \times \text{m}^3 \times \text{mol}^{-1}$. Phototransformation of trifluralin in air is rapid with a half-life ranging from 25 min to 5 hr (Canada, 2008). Laboratory volatility studies indicate that trifluralin is volatile from soil with losses reaching 100% when incorporation does not take place and less than 13% when incorporation is used. Trifluralin is shown to be more volatile under field conditions than laboratory conditions, and that volatilization of trifluralin increases with increasing soil moisture levels, temperature and rainfall, and decreases with the organic matter content in soils (Canada, 2008).

The PMRA considered the available air monitoring data, including information from the Northern Contaminants Program (Canada, 2013b), as well as data from Northern Canada, the Bering Strait, Alaska and Greenland (Canada, 2008, Canada, 2011). Even though phototransformation of trifluralin in air and water is rapid ($t_{1/2}$ up to 5 hrs), residues of trifluralin have been detected in air, precipitation (rain and snow) and fog in remote areas including the Canadian Arctic, Greenland, and the Bering Sea. These detections in remote regions indicate that trifluralin is likely bound to airborne particles which prevent phototransformation, and allow long range transport. The sorbed trifluralin is then deposited in dry or wet form to remote areas (Canada, 2008). The PMRA determined that the risk to the environment resulting from the presence of trifluralin in air in remote regions is expected to be negligible based on the maximum concentration of trifluralin of 3400 pg/m³ detected in air monitoring programs in Canada and 1.15 ng/L detected in Arctic water (Canada, 2011).

To reduce the amount of trifluralin entering the atmosphere via volatilization, several mitigation measures have been implemented. For example, trifluralin products must be incorporated in soil after application and applications should be limited to cool mornings and evenings when temperatures are at or below 15°C. All current product labels include the required label statements.

4.2 Potential risk to aquatic organisms, in particular the chronic risk to fish

Risk to aquatic organisms, expressed as a risk quotient (RQ), was calculated by dividing the exposure estimates by the appropriate toxicity value. The estimated risk quotient was then compared to the level of concern (LOC). For exposures to aquatic organisms, the PMRA's LOC is 1.0.

The PMRA assessed risks to aquatic organisms resulting from run-off and drift events based on modelled and measured concentrations of trifluralin in surface waters. Based on the modelled environmental concentrations for the spray drift event, the estimated acute RQs ranged from 0.24 to 40.4 and the chronic RQs ranged from 1.88 to 603, exceeding the PMRA's LOC of 1 for aquatic organisms (Canada, 2008). For the run-off event, the estimated acute RQs ranged from 0.03 to 5.64 and the chronic RQs ranged from 0.09 to 14.6, exceeding the PMRA's LOC of 1 (Canada, 2008). However, based on the concentration of trifluralin measured in freshwater aquatic systems (between 2007 and the present), the risks to aquatic organisms were deemed unlikely. In Canada, trifluralin was detected in less than 1% of surface water samples and only one sample (0.5 µg/L)¹ exceeded the most sensitive toxicity endpoint for aquatic organisms, i.e. a NOEC of 0.3 µg/L for freshwater fish. Thus, based on the low detection frequency and low levels of trifluralin in Canadian aquatic systems, the LOC for aquatic organisms is unlikely to be exceeded.

To minimize the potential risk to aquatic organisms, several risk mitigation measures have been implemented. For example, aquatic buffer zones are required to minimize spray drift to aquatic habitats during applications. Standard environmental precautionary statements to minimize runoff and aquatic exposure (by avoiding application to area with a moderate to steep slope, compacted soil, or clay, and when heavy rain is forecast, and by including a vegetative strip between the treated area and the edge of water body) and to indicate the toxicity to aquatic species are included on currently registered trifluralin labels. Based on the results of the risk assessment and taking into consideration the current conditions of use, the risks to aquatic species are not expected to be of concern.

5.0 Proposed Special Review Decision for Trifluralin

Evaluation of available scientific information related to the aspects of concern for the environment, indicated that the registered products containing trifluralin are acceptable for continued registration taking into account the current conditions of use. On this basis, the PMRA, under the authority of the *Pest Control Products Act*, is proposing to confirm the current registration of products containing trifluralin for sale and use in Canada.

This proposed special review decision is a consultation document.² The PMRA will accept written comments on this proposal up to 45 days from the date of publication of this document. Please forward all comments to Publications (please see contact information on the cover page of this document).

¹ PMRA No. 2485434 and 2485435

² "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

6.0 Next Steps

Before making a special review decision on trifluralin, the PMRA will consider all comments received from the public in response to this consultation document. A science-based approach will be applied in making a final decision on trifluralin. The PMRA will then publish a special review decision document, which will include the decision, the reasons for it, a summary of the comments received on the proposed decision and the PMRA's response to these comments.

Appendix I Registered Products Containing Trifluralin as of November 12, 2015

Registration Number	Marketing class	Registrant Name	Product Name	Formulation	Guarantee
18602	T	Makhteshim Agan of North America Inc.	Triflurex Trifluralin Technical	Solid	96.6%
18608	T	Nufarm Agriculture Inc.	Rival Technical Herbicide	Solid	96.7%
20434	T	Dow Agrosciences Canada Inc.	Trifluralin Technical Herbicide	Solid	96.3%
31518	T	Finchimica S.P.A.	Trifluralin Technical	Solid	96.3%
25723	MC	Dow Agrosciences Canada Inc.	Treflan 1.47% Manufacturing Concentrate	Granular	1.47%
14545	C	Dow Agrosciences Canada Inc.	Treflan Qr5 Granular Herbicide	Granular	5.00%
17223	C	Makhteshim Agan of North America Inc.	Triflurex 40 Ec Herbicide	Emulsifiable concentrate or emulsion	412 g/L
18612	C	Nufarm Agriculture Inc.	Rival Emulsifiable Concentrate Liquid Herbicide	Emulsifiable concentrate or emulsion	500 g/L
18926	C	Nufarm Agriculture Inc.	Rival 10g Superflow Granular Herbicide	Granular	10%
19521	C	Gowan Company, L.L.C.	Fortress Herbicide	Granular	4%
20836	C	Dow Agrosciences Canada Inc.	Treflan Granular Herbicide	Granular	5%
21522	C	Makhteshim Agan of North America Inc.	Trifluralin 10g	Granular	10%
21742	C	Dow Agrosciences Canada Inc.	Advance 10g Herbicide	Granular	10%

Registration Number	Marketing class	Registrant Name	Product Name	Formulation	Guarantee
22744	C	Loveland Products Canada Inc.	Bonanza 10g Granular Herbicide	Granular	10%
23933	C	Dow Agrosiences Canada Inc.	Treflan Emulsifiable Concentrate Herbicide	Emulsifiable concentrate or emulsion	480 g/L
28289	C	Loveland Products Canada Inc.	Bonanza 480 Liquid Herbicide	Emulsifiable concentrate or emulsion	480 g/L
28477	C	Fiberweb, Inc.	Biobarrier Root Control System	Impregnated fabric	17.5%
28780	D	Fiberweb, Inc.	Biobarrier Root Control System (Domestic)	Impregnated fabric	17.5%

C= commercial, MC= manufacturing concentrate, D= domestic, T= technical grade active ingredient

References

Published Information

PMRA Document Number	Reference
1617080	Canada, 2008. Pest Management Regulatory Agency Proposed Re-evaluation Decision PRVD2008-22, <i>Trifluralin</i> .
1798545	Canada, 2009a. Pest Management Regulatory Agency Re-evaluation Decision RVD2009-09, <i>Trifluralin</i> .
2581152	Canada, 2009b. Additional Information and Considerations for the Review of Trifluralin under the UNECE Protocol on POPs. December 2009. DACO: 8.6. Available from https://www.unece.org/fileadmin/DAM/env/documents/2009/EB/eb/Informal%20docs/Informal%20doc%207%20Additonal%20information%20on%20Trifluralin_sumbited%20by%20Canada.pdf
2581153	Canada, 2011. Additional Information and Considerations for the Review of Trifluralin under the UNECE LRTAP Protocol on POPs. August 2011. DACO: 8.6. Available from https://www.unece.org/fileadmin/DAM/env/documents/2011/eb/wg5/WGSR49/Informal%20docs/14_Canadian_Addendum_for_trifluralin_UNECE_final_August_2011.pdf
2405939	Canada, 2013a. Pest Management Regulatory Agency Regulatory Note REV2013-06, <i>Special Review Initiation of 23 Active Ingredients</i> .
2581151	Canada, 2013b. Northern Contaminants Program - Canadian Arctic Contaminants Assessment Report III 2013 - Persistent Organic Pollutants in Canada's North. DACO: 8.6
2581160	European Commission, 2010a. Commission Decision of 25 June 2010 concerning the non-inclusion of trifluralin in Annex I to Council Directive 91/414/EEC. <i>Official Journal L 160, 26/06/2010</i> . DACO: 12.5
2581161	European Commission 2010b. Review report for the active substance trifluralin finalised in the Standing Committee on the Food Chain and Animal Health at its meeting on 11 May 2010 in support of a decision concerning the non-inclusion of trifluralin in Annex I of Directive 91/414/EEC. DACO: 12.5

Unpublished Information

PMRA Document Number	Reference
2408645	Saskatchewan Water Security Agency. 2014. Water monitoring data on 2,4-D and trifluralin, submitted following the PMRA's February 2014 monitoring data request for active ingredients under special review. Data submitted February 27, 2014. Government of Saskatchewan. DACO 8.6.
2413008	MDDEFP. 2014. Monitoring data on 2,4-D and trifluralin in surface water and groundwater submitted following the PMRA's February 2014 monitoring data request for active ingredients under special review. Data submitted April 15, 2014. Banque de données sur la qualité du milieu aquatique (BQMA), Quebec, ministère du Développement durable, de l'Environnement, de la Faune et des Parcs. Direction du suivi de l'état de l'environnement. DACO 8.6
2413013	MDDEFP. 2014. Monitoring data on 2,4-D and trifluralin (and other pesticides) in raw surface water prior to entry in drinking water treatment station and in treated water submitted following the PMRA's February 2014 monitoring data request for active ingredients under special review. Data submitted April 15, 2014. Banque de données sur la qualité du milieu aquatique (BQMA), Quebec, ministère du Développement durable, de l'Environnement, de la Faune et des Parcs. Direction du suivi de l'état de l'environnement. DACO 8.6
2424873	Saskatchewan Water Security Agency. 2014. Water monitoring data on 2,4-D and trifluralin, submitted following the PMRA's April 2014 monitoring data request for active ingredients under special review. Data submitted May 1, 2014. Government of Saskatchewan. DACO 8.6.
2430955	Ontario Ministry of the Environment. 2014. Water monitoring data on trifluralin in Ontario urban streams submitted following the PMRA's April 2014 monitoring data request for active ingredients under special review. DACO 8.6
2462785	Ontario Ministry of the Environment and Climate Change. 2014. Monitoring data on atrazine, simazine, trifluralin and 2,4-D in Ontario raw water and treated drinking water. Submitted following the PMRA's April 2014 monitoring data request for active ingredients under special review. Data submitted September 19, 2014. DACO 8.6.
2483901	Water Quality Management Section, Manitoba Conservation and Water Stewardship. 2014. Monitoring data for 2,4-D, atrazine, simazine, trifluralin and pentachlorophenol received following the PMRA's December 2014 request for monitoring data for active ingredients under special review. 123 Main Street, Suite 160, Winnipeg MB R3C 1A5, Data received December 15, 2014. DACO 8.6.